

CLAIMS

What is claimed is:

1. A printing apparatus having a main body, comprising:
 - a paper feeding section provided to the main body;
 - a signal supply section to supply a signal indicative of types of paper to be fed from the paper feeding section provided to the main body;
 - at least one friction member provided to form an angle within a predetermined range in relation to a leading edge of a sheet of paper picked up from the paper feeding section so that a predetermined frictional force is applied to the leading edge of the sheet of paper, wherein the structure of the friction member changes within the predetermined range;
 - at least one elastic member to elastically bias the at least one friction member in a first direction;
 - a cam unit movably installed to the main body, to forcibly move the at least one friction member in a second direction opposite to the first direction to change the structure of the friction member while the cam unit is being moved by driving force;
 - a driving force supply unit movably installed to the main body, to supply driving force to the cam unit at the time of being moved; and
 - a control section to control the driving of the driving force supply unit based on the signal in relation to the types of paper supplied via the signal supply section.
2. The apparatus according to claim 1, wherein the cam unit comprises:
 - a camshaft rotatably installed to the main body having at least one projection contacted with the rear surface of the at least one friction member; and
 - a link arm pivotably installed to the main body and linked to the camshaft to rotate the camshaft while being pivoted, wherein the link arm is selectively pivoted by the driving force supply unit.
3. The apparatus according to claim 1, wherein the driving force supply unit comprises:
 - a carriage to receive an ink cartridge, the carriage installed to the main body so as to reciprocate; and

a contact member connected to the carriage, wherein the contact member makes contact with the cam unit to forcibly move the cam unit to a predetermined area when the carriage moves.

4. The apparatus according to claim 3, wherein the carriage is movable between a printing area to print an image on the sheet of paper and a home position spaced from the printing area, and the carriage interferes with the cam unit when the carriage moves from the printing area to the home position.

5. The apparatus according to claim 2, further comprising:
the at least one friction member having two or more friction members with a predetermined interval therebetween,
at least two cam projections provided to the camshaft to correspond to the two or more friction members, and
a link pin offset provided at a rotational center of the camshaft.

6. The apparatus according to claim 5, wherein the link arm comprises:
a slot at one end and a guide part at the other end, wherein the link pin is engaged in the slot and the guide part has a contact surface, which is slantly formed in relation to the direction of the rotational axis of the link arm and contacts with the driving force supply unit.

7. The apparatus according to claim 1, wherein the signal supply section comprises:
a paper detection sensor to detect the type of paper loaded to the paper feeding section.

8. The apparatus according to claim 1, wherein the signal supply section comprises:
a memory to store information regarding the type of paper inputted through a print driver.

9. The apparatus according to claim 1, wherein types of the paper loaded to the paper feeding section comprises:
a first type of paper having a thickness within a predetermined range, and

a second type of paper thicker than the first type of paper, wherein when the first type of paper is loaded to the paper feeding section, the control section drives the driving force supply unit so that the at least one friction member is moved in the second direction to change the structure of the at least one friction member.

10. The apparatus according to claim 9, wherein the at least one friction member forms a larger angle in relation to the leading edge of the sheet of paper to be picked up after being moved to a second position where the at least one friction member has been forcibly moved than after being moved to a first position where at least one friction member has been elastically biased.

11. A method to pick up a paper in a printing apparatus having a main body, at least one friction member installed to the main body to change structure of the friction member to form an angle in relation to a leading edge of a sheet of paper picked up from a paper feeding unit and elastically biased in a first direction; a cam unit movably installed to the main body to forcibly move the at least one friction member to a second direction while the cam unit is being moved by driving force; and a driving force supply unit movably installed to the main body to supply driving force to the cam unit at the time of being moved, the method comprising:

supplying a signal indicative of a type of the sheet of paper to be picked up;

classifying the paper to a first type having a thickness within a predetermined range or a second type thicker than the first type of paper based on the signal;

supplying a driving force to the cam unit when the paper is classified as the first type of paper;

moving the at least one friction member to the second direction by driving the cam unit; and

picking up the paper from the paper feeding section when the at least one friction member has been moved in the second direction.

12. The method according to claim 11, wherein the operation of supplying the signal comprises:

supplying a detection signal from a detection sensor that detects the type of paper loaded in the paper feeding section provided to the main body.

13. The method according to claim 11, wherein the operation of supplying the signal comprises:

supplying a signal from a memory having stored information in relation to the types of paper inputted through a print driver by a user.

14. The method according to claim 11, wherein the printing apparatus further comprises a carriage installed in the main body to reciprocate between a printing area and a home position, and a contact member connected to the carriage to connectively move the cam unit when the carriage is moved, wherein the operation of supplying the driving force comprises:

positioning the carriage at the printing area,

moving the carriage to the home position, and

contacting the contact member comes with the cam unit when the carriage is moved to the home position.

15. The method according to claim 11, wherein the printing apparatus further comprises a link arm pivotably installed in the main body, and the cam unit comprises a camshaft provided with at least one cam projection formed to be projected, wherein the operation of moving the at least one friction member in the second direction comprises:

contacting the link arm with the driving force supply unit and receiving driving force to pivot the link arm,

connectively rotating the camshaft linked to the link arm, and

compressing the rear surface of the at least one friction member in the second direction while the cam projection is being rotated along with the camshaft.

16. The apparatus according to claim 1, wherein the at least one friction member provided corresponds to the at least one elastic member.

17. The apparatus according to claim 1, wherein an angle formed between the at least one friction member and the leading edge of the sheet of paper when the at least one friction member is moved in the first direction is larger than an angle formed when the at least one friction member is moved in the second direction.

18. The apparatus according to claim 9, wherein when the second type of paper is loaded to the paper feeding section, the control section does not drive the driving force supply unit, and the at least friction member is not moved in the second direction.

19. A method to pick up a plurality of papers in a printing apparatus, comprising:
classifying the plurality of papers to a first type having a thickness within a predetermined range or a second type thicker than the first type; and
dynamically changing a structure of a friction member based on the classification so that each of the plurality of papers are separately picked up.

20. A method to pick up paper in a printing apparatus, comprising:
supplying a signal indicative of types of the paper to be picked up;
classifying the paper to a first type having a thickness within a predetermined range or a second type thicker than the first type based on the signal;
moving a friction member upon classifying the paper as the first type or the second type;
and
picking up the paper when the friction member has been moved based on the classification.

21. The method according to claim 20, wherein the operation of supplying the signal comprises:

supplying a detection signal via a detection sensor that detects the types of paper loaded in the paper feeding section provided to the main body.

22. The method according to claim 20, wherein the operation of supplying the signal comprises:

supplying a signal from a memory that stores information in relation to the types of paper inputted through a print driver by a user.

23. The method according to claim 19, wherein a structure of the friction member allows a predetermined frictional force to be applied to a leading edge of the paper.

24. The apparatus according to claim 1, wherein the main body further comprises:

a base;
a main frame installed to a top portion of the base; and
a pivot pin to pivotably connect a lower end of the at least one friction member to the base of the main body.

25. The apparatus according to claim 17, wherein a frictional force between the at least one friction member and the leading edge of the sheet of paper when the at least one friction member is moved in the first direction is smaller than when the at least one friction member is moved in the second direction.

26. A method to pick up paper in a printing apparatus having friction member, comprising:

determining whether the paper belongs to a first type of paper or a second type of paper;
moving the friction member based on the determination, wherein an angle formed between the friction member and a leading edge of the paper when the friction member is moved in a first direction is larger than an angle formed when the friction member is moved in a second direction.

27. The method according to claim 26, wherein a frictional resistance applied to the leading edge of the paper by the friction member increases when the angle formed between the friction member and the leading edge of the paper is reduced.

28. The method according to claim 26, wherein a frictional resistance applied to the leading edge of the paper by the friction member decreases when the angle formed between the friction member and the leading edge of the paper is increased.

29. A printing apparatus having a friction member to pick up paper, comprising:
a paper feeding section to supply a signal indicative of types of paper fed to the paper feeding section;
a friction member to form an angle within a predetermined range in relation to a leading edge of a sheet of paper picked up from the paper feeding section so that a predetermined frictional force is applied to the paper; and

a control section to control position of the friction member based on the signal in relation to the type of paper.

30. The apparatus according to claim 29, further comprising:
an elastic member to elastically bias the friction member in a first direction; and
a cam unit to forcibly move the friction member in a second direction opposite to the first direction.

31. The apparatus according to claim 30, wherein a frictional force between the friction member and the leading edge of the sheet of paper when the friction member is moved in the first direction is smaller than when the friction member is moved in the second direction.